

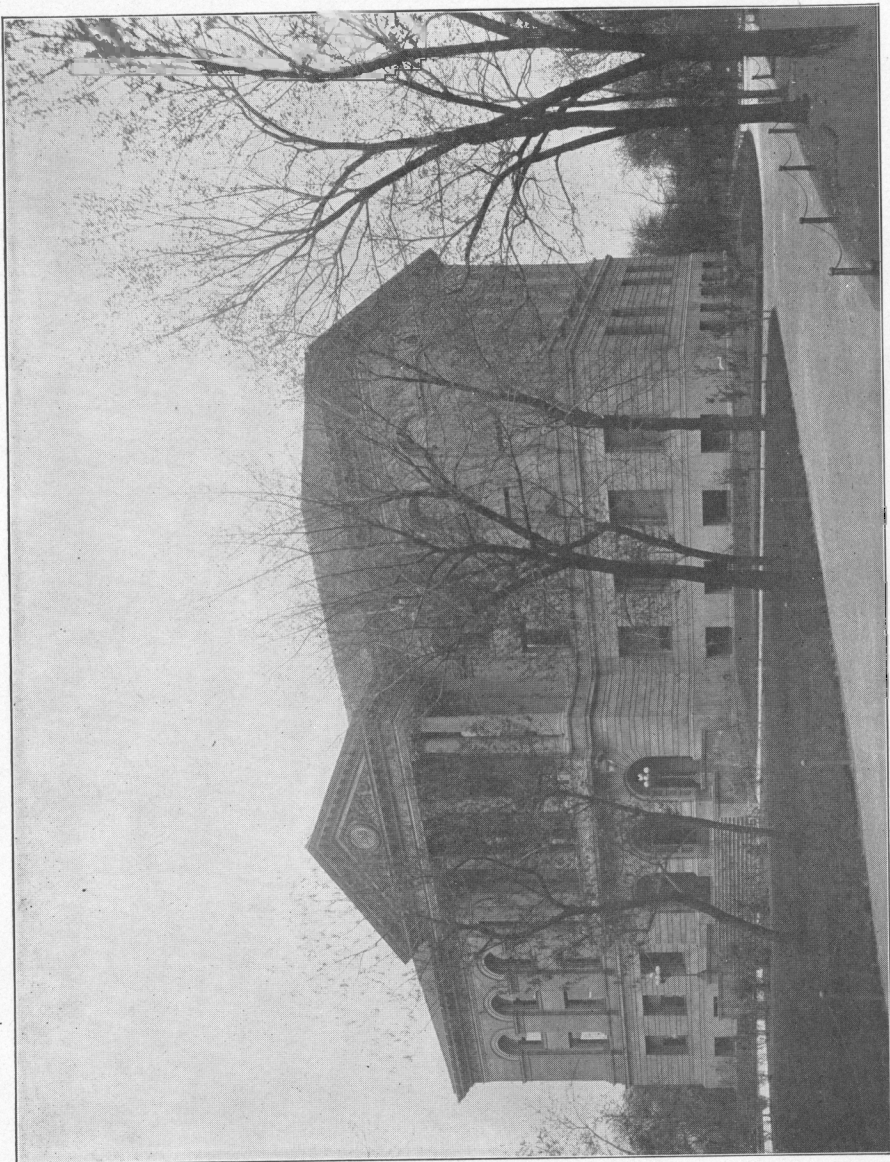
BULLETIN
OF THE
Chicago Academy of Sciences

Annual Report for the Year 1909

Winter and Spring Announcements



CHICAGO
Published by the Academy
February, 1910



MATTHEW LAFLIN MEMORIAL BUILDING—THE CHICAGO ACADEMY OF SCIENCES

Vol. III

No. 3

BULLETIN
OF THE
Chicago Academy of Sciences

Annual Report for the Year 1909

Winter and Spring Announcements



CHICAGO
Published by the Academy
February, 1910

THE CHICAGO ACADEMY OF SCIENCES

OFFICERS

Dr. Thomas C. Chamberlin.....President
Mr. Albert L. Stevenson.....First Vice-President
Mr. Charles H. Blatchford.....Second Vice-President
Dr. Wallace W. Atwood.....Secretary

BOARD OF TRUSTEES

Mr. Joseph R. Putnam.....Term expires January, 1910
Mr. Charles F. Gunther.....Term expires January, 1910
Mr. Louis E. Laflin.....Term expires January, 1911
Mr. Charles A. Heath.....Term expires January, 1911
Dr. Henry J. Furber.....Term expires January, 1912
Mr. La Verne W. Noyes.....Term expires January, 1912
Mr. Charles S. Raddin.....Term expires January, 1913
Mr. Charles H. Blatchford.....Term expires January, 1913
Mr. Ira J. Geer.....Term expires January, 1914
Mr. Charles Dickinson.....Term expires January, 1914

EX-OFFICIO

Dr. Thomas C. Chamberlin.....President of the Academy
Mr. Francis T. Simmons
.....President Board of Commissioners, Lincoln Park

EXECUTIVE BOARD

Dr. Adolph Gehrman.....Term expires January, 1911
Dr. J. Holinger.....Term expires January, 1911
Dr. Lester Curtis.....Term expires January, 1912
Dr. Stuart Weller.....Term expires January, 1912
Mr. Albert Dickinson.....Term expires January, 1913
Dr. N. S. Davis.....Term expires January, 1913

EX-OFFICIO

Dr. Thomas C. Chamberlin.....President of the Academy
 Mr. A. L. Stevenson.....First Vice-President
 Mr. Charles H. Blatchford.....Second Vice-President
 Mr. Joseph R. Putnam.....President, Board of Trustees

STAFF OF THE MUSEUM

Mr. Frank C. Baker.....Curator
 Mr. Frank M. Woodruff.....Taxidermist
 Miss Mellie G. Bunnell.....Office Assistant
 Mr. Robert Coombs.....Museum Attendant

HONORARY CURATORS

Dr. Thomas C. Chamberlin.....General Geology
 Dr. Stuart Weller.....Paleontology
 Dr. Oliver C. Farrington.....Mineralogy
 Prof. E. J. Hill.....Botany

Mr. Carlyle S. Baer.....Assistant Secretary of the Academy

THE UNIVERSITY OF CHICAGO
 CHICAGO, ILL., January 11, 1910 .

To the Members of the Chicago Academy of Sciences:

I regret very much that imperative circumstances prevent me from being present with you at the Annual Meeting. As I have been abroad the larger part of the year, I should greatly enjoy and profit by the reports of the active officers of the Academy. I am convinced from what I have learned since my return that the affairs of the Academy have prospered to an unusual degree, and that the work of the Academy is steadily growing in effectiveness. I am firm in the conviction that the Academy is working rapidly and successfully into the lines that it is best fitted to follow and that will be most useful to the community and to the cause it represents. The new phase of policy upon which it is entering seems to me well chosen, and I am sure that if steadily followed great fruitage will appear in due time. The Academy is finding its place and filling it, a new place in some sense be-

cause the conditions in the scientific and educational worlds have changed in recent years. The place of science in human interests is greatly increased and is becoming more fundamental with each year. So the Academy, working at the foundation of scientific education in our community, is doing a greater work than even it is itself aware of. Good fruit is not raised in a day and is not noisy in the process, but I am fully persuaded that good fruit and much of it is being prepared for the gathering by the laborers of the Academy.

Very truly yours,

(signed) THOMAS C. CHAMBERLIN,

President of the Academy

REPORT OF THE BOARD OF TRUSTEES FOR THE YEAR 1909

The business interests of the Academy have undergone no great change during the last year. The income-paying property of the Academy now consists of the following investments:

The land and building on the northwest corner of Park Avenue and Ohio Street, in Austin, which has cost us.....	\$41,603.94
\$20,000 in bonds of the Chicago City Railway.....	20,900.00
\$17,000 in bonds of the Chicago Telephone Co.....	17,625.56
\$10,000 Mortgage of Stewart Spalding.....	10,025.00
\$15,000 Mortgage of Albert Dickinson.....	15,000.00
	<hr/>
	\$105,154.50

The income of the Academy from all sources as shown by the Treasurer's report has been.....	\$11,464.89
and the expenses of operation as shown by same report	12,594.83
	<hr/>

indicating that we have exceeded our income by... \$1,129.94

But as our entire capital is derived from the Lowther fund of \$3,000 and the Willner Fund, \$100,000 and our investments amount, at cost, to \$105,154.50, it appears our investments, at cost, exceed our capital by \$2,154.50, indicating that we have saved and have invested that sum out of the income of previous years.

Our investments in bonds and mortgages are all at the rate of 5 per cent. The net income of the Austin property after deducting taxes and current expenses has been \$2,605.53, or about $6\frac{1}{3}$ per cent. on the cost. Of these expenses, \$283.46 was expended in the purchase and installation of nine gas ranges to replace old ones which were too small and inadequate for the needs of the tenants and two sinks and water closets to replace others which were broken. These improvements are probably good for ten years to come and can hardly be classed as current expenses.

At a recent meeting of the Board of Trustees, the work for the coming year was classified, and the necessary sums appropriated for the performance of the same, viz.:

For salaries	\$6,870.00
For publications	300.00
For museum expenses	775.00
For library expenses	225.00
For educational work	600.00
For general expenses	330.00
<hr/>	
Total	\$9,130.00

We look forward hopefully to the time when we shall be able greatly to increase our force and our usefulness in the community.

JOSEPH R. PUTNAM,
President Board of Trustees

THE ANNUAL REPORT OF THE SECRETARY FOR THE YEAR 1909

To the Members of the Chicago Academy of Sciences:

The past year will probably come to be looked upon as a period of transition. With the increased resources which come with the Willner bequest it was possible for the Academy to undertake, in addition to the expansion of the Museum, other lines of educational work. During the past year the officers of the Academy have been investigating the problem as to what lines of work should be undertaken. We have desired to co-operate with the public and private schools in the promotion of

the study of the natural sciences and in the growth of the general scientific spirit of work. In addition to the work with the schools, it has been our desire to offer something to the general public in addition to the Museum exhibits. In this work the same general motives have governed our actions. We desire that the general public may have greater opportunities to become acquainted with the natural history sciences and to come more and more into sympathy with the spirit of scientific research.

Before undertaking any new lines of work we called a meeting of the principals of the North Side city schools and invited also to that meeting representatives of certain of the private schools in the vicinity of the Academy. At this meeting, and subsequent similar gatherings of the North Side teachers, the question was fully debated as to what were the real needs in the schools that we might hope to meet. It has not been our intention to introduce any work which would add to the responsibilities of those engaged in teaching, but to co-operate in such a way as to make the teaching work both easier and more efficient. The problem was analyzed into three parts.

1. There were the teachers who wished to become better prepared to offer the work in science or nature-study which they were expected to give in the regular courses.

2. The children whom we might work with directly in offering special or extra advantages in the study of science outside of school hours.

3. The material or actual natural history objects that the teachers need in their classroom.

Each of these needs we have attempted to meet. For the teachers, a course was given of twelve two-hour lectures by Dr. Henry C. Cowles, of the University of Chicago, on "Plants and Their Field Relations." This course was arranged through the Extension Division of the University, so that the teachers should secure university credit for the work done. The work was conducted as a regular college course. Twenty-eight teachers registered for this work and paid the fee necessary for membership in the class. These teachers have also applied for associate membership in the Academy. At the close of the course, the secretary received personal letters from nearly every member of this class expressing gratitude to the Academy for

offering such work at so convenient a center for them, and expressing the desire that other similar courses may be offered in the future for the benefit of the teachers. I will quote here a few of the letters which are typical of those received from the members of this class.

As a member of the class under Prof. Cowles, I write to acknowledge my appreciation of the course, and to signify my desire that other similar work be given in the Spring. A course in field zoölogy would be my choice although I should like and probably join a class in geology if it were the preference of the others interested. I am a kindergartner, and though these courses are not always of direct use in my work, yet I find them very helpful in helping one to see the wonders in nature too often overlooked and in leading one to find reasons for plant and animal behavior.

(signed) BERNICE C. PALMER

Having been a member of Dr. H. C. Cowles's Nature Class for the past three months, I desire to express my appreciation and gratitude for the privilege I have enjoyed.

The manner in which Dr. Cowles presented and elucidated the various points was to me an object-lesson in good teaching.

The location of the Academy makes it an ideal center for any educational work that the Academy might wish to undertake.

(signed) SARAH J. BAYNES

The work which Dr. Cowles has presented to us in "Nature-Study" has been very profitable and enjoyable. I wish to express my sincere thanks and appreciation to you and to the trustees of the Chicago Academy of Sciences for the interest you have shown in the class.

(signed) ANNA B. FISHER

I want to tell you how valuable the course in botany that I have been taking this Fall in Dr. Cowles's class is to me, and how much I appreciate the efforts of the Board that has made such work possible to teachers, and so convenient as well. I hope that similar work may be continued.

I myself would like to take a course in astronomy or in geology, to follow the work we are now doing in botany.

I earnestly hope there may be teachers enough wanting the work to make it possible to have the work continued.

(signed) MABEL E. GILPATRICK

For the children we arranged a course of six Saturday afternoon lessons in nature-study, to be given by Dr. H. S. Pepoon

of the Lake View High School. The admission to this class was by appointment as delegate from one of the rooms in the seventh- or eighth-grade classes in the public schools, and it was free to those so appointed. We had expected that there might be twenty-five or thirty children who would undertake to do this work on their Saturday afternoons. At the first regular meeting of the class there were one hundred and one delegates who applied for membership. During the continuation of the work the class grew to one hundred and thirty, having an average attendance of one hundred and twenty-two. It became necessary to alter the plan of classroom work somewhat, but Dr. Pepoon in a wonderfully happy way conducted this large class through the six lessons, holding the attention of all, arousing a new and broader interest in each one, and sending them away enthusiastic reporters to their different classes.

The delegate plan worked even better than we had anticipated. Dr. Pepoon reports that he never had a class more attentive and interested in their work, nor more interesting to the teacher. Each representative felt that he or she had a responsibility to the classmates to whom the lesson was to be reported. The teachers have carried out the delegate plan farther than we had expected. In many cases the children have reported verbally. In some instances the delegate prepared a written report which was read to the class. At some schools where there were literary societies or improvement clubs, the report has been given at the regular meeting of the student organization. By this plan the delegate knew that he had something to tell that his classmates did not know equally well. It was not like the common lesson which each child had been told to get for that day. It was something fresh, and the child-speaker appreciated that he had an audience. Furthermore, the audience was getting something from one of their own class, and, as many teachers have reported, the attention was more than they themselves could have had, had they served as the delegates.

At the close of the course I asked the teachers or principals to give me the benefit of any suggestions or criticisms that they might make regarding the work we had been doing with the children, and the response has been most gratifying and encouraging. Thirty-two letters have been received from the principals, others from the teachers, and a few from the children

who acted as delegates. In each case there has been a strong approval of the delegate system and an urgent request that the opportunities offered in this way to the children be continued. I will quote from a few of the letters which are illustrative of the expressions received from the school people.

From reports that have been received from a number of sources it would appear that the six lessons on nature-study conducted at the Academy of Sciences by Dr. Pepoon have resulted in a considerable amount of benefit to the pupils participating, primarily, and to the schools represented, as a further outcome.

The pupils delegated have been very largely stimulated to take an interest in the multitude of living forms about them, and this interest—through the reports made to the various schools—has, in turn, created a much more extended desire on the part of many more pupils to know something of plants and animals, not by a disconnected and more or less confused series of exercises having no definite aim, but through orderly and in reality scientific study of certain definite problems of living organisms.

If further classes among the seventh and eighth grades can be conducted in a similar manner, it appears to me that permanent good may be accomplished, and the foundations laid for future study along such lines in High School, or other institutions, or as a matter of fact, in everyday life unconnected with any place of learning.

(signed) B. F. BUCK

I wish to express my gratitude to the Academy for the splendid facilities afforded to our pupils and schools.

The pupils in Dr. Pepoon's class have brought back a fund of information and aroused an interest in botany which is both delightful and surprising.

The teachers have enjoyed the Friday night lectures, and I myself as a member of Dr. Cowles's class feel that I owe a personal debt to the Academy for the privilege of meeting there and fostering the educational work.

I sincerely hope that you will be able to continue these lectures and classes.

(signed) A. C. ELLINGS

This opportunity of expressing my appreciation of the work done by the Chicago Academy of Sciences this fall gives me much pleasure.

The children of my room who attended Dr. Pepoon's class brought back many interesting notes which they were able to tell in a clear, intelligent way to the rest of the children.

ANNUAL REPORT

II

I attended most of the evening lectures and gained much information which I expect to turn to good account in the teaching of the new subject that has been added to the Eighth Grade work.

I hope next fall may bring another season of just such pleasant and useful instruction.

(signed) V. L. HUDERER

Allow me to add my word of commendation for the good work done by your institution this fall for the benefit of our North Side pupils.

I do most earnestly hope that it may again be within the power of the Academy next fall, or still better, next spring to continue this plan. I, for one, am anxious that more of our pupils may be given an opportunity to profit by the lectures.

Thanking you most heartily for the privilege of sending our representatives to the Academy on these occasions, I am

Very gratefully yours,

(signed) MARY I. PURER

Nothing that has been done in the LaSalle School during the present term equals in value that which resulted from Dr. Pepoon's class. The subject-matter was interestingly and instructively presented, which is the first essential. But the feature most beneficial, I think, is the "delegate" feature.

Our delegates realized that, during the lecture, they must be ears and eyes for their classmates; and that, during the report to their classmates, they must be voice and personality for the lecturer. They responded with great efficiency to these conditions.

I am almost convinced that these reports, with their accompanying charts, and the charm of novelty, brought more to the pupils than they could possibly receive from regular room teachers. It was pleasant for me to watch the delegate making report, using crayon at the blackboard and reproducing, as she talked, the charts and diagrams of the lecturer. There was power which held all in the room to her slightest word or motion.

I certainly shall be glad to have other courses offered at early dates, and believe the present plan the most satisfactory yet devised.

(signed) M. G. HOGGE

We, the pupils of Room 2, LaSalle School, wish to express our grateful appreciation for the lectures you have given to us through our delegates.

Through these lectures our interest has been aroused and we have learned of many of the hidden pockets where Nature stores away her loveliness.

THE CHICAGO ACADEMY OF SCIENCES

During the series of lectures we have gained mentally and morally.

We have been unusually successful in our choice of delegates, for we received a valuable return for the time we spent on that study.

We would be very thankful if the lectures be continued next year, for the series that we have had were exceedingly interesting.

I was the delegate sent from Room 2, LaSalle School, to the series of lectures given Saturday afternoons at the Academy of Sciences. A large part of what I heard was new to me and it was all very interesting indeed. I learned even more going as a delegate from the whole room, for I felt responsible for everything I heard. I know that the lectures were a great help to the delegates sent and if the other pupils in our room enjoyed the lectures as much as I did I am sure they would be greatly pleased to have the lectures continued next year.

(signed) MARY L. DIXON

I have been especially interested in the Friday evening lectures, and our room does not want them discontinued, for all say they learn many things they never knew before. I have been impressed by the lectures, and wish to show gratitude. While taking notes I would feel the responsibility of reporting to my classmates. Every lecture was interesting to me and my classmates. I wrote a report of every lecture and put it in the hands of my teacher. I hope the lectures will be continued.

(signed) DONALD E. CABLE

The following list gives the schools that were represented in this class and the number of children who came from each school to do the work:

DR. PEPOON'S CLASS

Adams School	1
Alcott School	4
Audubon School	4
Agassiz School	2
Arnold School	4
Avondale School	3
Bancroft School	3
Blaine School	2
Burley School	4
Belding School	2
Columbus School	1
Coonley School	4
Drummond School	3
Field School	4

Goudy School	3
Greeley School	4
Hamilton School	4
Irving Park School	1
Jahn School	2
LaFayette School	7
Logan School	1
Langland School	2
Lincoln School	6
Lane School	1
Linné School	4
LaSalle School	5
Manierre School	4
Robert Morris School	7
Motley School	1
Nettelhorst School	8
Newbury School	2
Ogden School	1
James Otis School	2
Prescott School	2
Geo. Schneider School	2
Schiller School	1
Talcott School	1
Ole A. Thorp School	3
Lyman Trumbull School	4
Wicker Park School	2
Richard Yates School	1

A fair estimate of the number of students in each school-room represented by a delegate is 40, which indicates that each lesson was repeated to about 5,000 children.

The problem of supplying museum material to the teachers has been attacked and some progress has been made, but we are as yet unprepared to meet the great demand in this direction. Under the supervision of the Curator, twenty-five loan collections were prepared during the spring and made available for those teachers who would send students for them and agree to return them to the Academy. These collections were in almost constant use, and many requests came when there were no collections available. For the opening of the fall, twenty regular traveling collections were ready. These were placed in especially

prepared cabinets that were easily portable, and the arrangement has been to have the children call and return them to the Academy building. A collection can be borrowed by a teacher for a period of one week, and the record below shows that during the fall months eighty such loans have been made. The range of subjects illustrated is as yet very limited, and with an increase in the number of such loan collections we anticipate a much more common use of such material in the classroom. This plan of loaning small museum collections is being carried on on a large scale in other cities, and the plan can undoubtedly be promoted here and add greatly to the efficiency of science-teaching in the schools, at the same time simplifying the work of the teacher. We expect to prepare a number of collections illustrating products of commercial importance. Articles will be secured from industrial plants illustrating the raw material and the various stages of manufacture up to the finished product. Such collections should prove of value in geographical work, in commercial studies, and also in the nature-study courses. We hope also to be able to supply material of value to the science teachers in the high schools. Requests have been received from them, and attempts will be made during the coming year to supply this demand.

The following table gives a record of the loans made during the fall months:

COLLECTIONS LOANED IN THE FALL

SCHOOL	DATE	COLLECTION
Arnold School	October	Common Rocks.
	"	Birds That Live Mostly in the Air.
	"	The Pearl Button Industry.
	"	Summer Residents.
	"	Summer Residents.
	"	Birds That Live Mostly in the Fields.
	"	Birds That Live Mostly in the Fields.
	November	Early Spring Arrivals.
	"	Winter Residents.
Burley School	"	Winter Residents.
	"	Early Spring Arrivals.
	November	Gold, Silver, Copper, Lead, and Tin Ores.
Franklin School	"	Silk Industry.
	October	Early Spring Arrivals.
	"	Birds that Live Mostly in the Air.



LOAN COLLECTIONS—BIRD SERIES AND ECONOMIC SERIES

ANNUAL REPORT

15

SCHOOL	DATE	COLLECTION
Franklin School	November	Winter Residents.
	"	Summer Residents.
	"	Residents.
	"	Birds That Live Mostly in the Air.
	"	Residents.
	"	Silk Industry.
	December	The Pearl Button Industry.
	"	English Sparrow.
Headley School	October	Silver, Gold, Copper, Lead, and Tin Ores.
	"	The Ivory Button Industry.
Knickerbocker School	November	The Pearl Button Industry.
	September	Winter Residents.
	"	Residents.
LaSalle School	"	Early Spring Arrivals.
	September	Early Spring Arrivals
Lake View High School	October	Residents.
	October	16 Slides. (For Dr. Pepoon.)
Lake View High Branch	December	Special. (For Dr. Pepoon.)
	November	Crow.
	December	Special Collection of 6 Birds.
Lincoln School	"	Special.
	October	The Pearl Button Industry.
	"	The Ivory Button Industry.
	"	Winter Residents.
	November	Silk Industry.
Linné School	October	Silk Industry.
Manierre School	September	Residents.
	October	Winter Residents.
	"	Early Spring Arrivals.
	"	Birds That Live Mostly in the Air.
	"	The Pearl Button Industry.
	November	Artificial Abrasives.
	"	Silk Industry.
	"	Iron Ores.
Morris School	September	Summer Residents.
	October	The Pearl Button Industry.
	"	Silk Industry.
	"	Coal.
	"	Residents.
	November	Birds That Live Mostly in the Air.
	"	Birds That Live Mostly in the Fields.
	"	Artificial Abrasives.
	"	The Ivory Button Industry.

SCHOOL	DATE	COLLECTION
Morris School	December	Early Spring Arrivals.
	"	Aluminum Ores.
Nettlehorst School	October	Summer Residents.
	"	Birds That Live Mostly in the Fields.
	"	Silver, Gold, Copper, Lead, and Tin Ores.
Pulaski School	October	Coal.
	November	Iron Ores.
	"	The Pearl Button Industry.
	December	Winter Residents.
	"	Silver, Gold, Copper, Lead, and Tin Ores.
	"	Silk Industry.
Parker School	November	3 Skulls.
Schiller School	October	Silver, Gold, Copper, Lead, and Tin Ores.
	"	Iron Ores.
	November	Common Rocks.
	"	Coal.
	"	The Ivory Button Industry.
Thorp (Ole A.) School	September	Silk Industry.
Waller High School	October	Seal Coat.
	December	42 Colored Bird Slides.
	"	Arctic Coat.
	"	Colored Bird Slides.
Total number schools.....18.		Collections.....80.

In addition to the regular loan collections, the Museum has from time to time loaned specimens to various educational institutions in and about Chicago. The list given below is a record of these loans for the year 1909:

SCHOOL	DATE	SPECIMENS LOANED
Agassiz School	March	Water tank for projecting microscopic slides on the screen.
	September	<i>Anosia plexippus</i> .
Arnold School	March	7 Specimens of "coal plants."
Alcott School	March-April	Collection of 11 migrant birds.
Burley School	March	25 bird slides.
	April	14 specimens of mollusks.
	June	Collection of birds. 9 bird-skins.
	May	8 bird-skins.
Brainard School	April	6 bird-skins.
	"	10 bird-skins.

ANNUAL REPORT

17

SCHOOL	DATE	SPECIMENS LOANED
Brainard School	April	6 bird-skins.
	May	11 bird-skins.
Coonley School	March	Collection of 12 migrant birds.
Franklin School	April	11 bird-skins
Goudy School	March	Model of glacier and glaciated rocks.
	"	15 bird-skins.
	"	11 birds in case.
	"	Grand Canyon of Colorado River.
	April	Box of 8 birds.
	"	8 waterbirds.
Greeley School	"	7 birds.
	March	8 Birds.
	"	23 birds representing four seasons.
	April	6 bird-skins.
Hawthorne School	"	6 bird-skins.
	April	11 bird-skins.
	May	6 bird-skins.
	"	7 bird-skins.
Jahn School	April	Nautilus section and Mr. Baker's book.
	"	Collection of 12 migrant birds.
Lincoln School	March	Tube showing "development of the beetle."
	"	6 bird-skins.
	"	Silk industry.
	"	Specimen of the "edible snail."
	April	2 bird-skins.
	"	Specimen of butterflies (collections 4 and 5).
	"	Specimens of shells and lecture.
Morris School	May	11 bird-skins.
	March	Collection of birds, and Mr. Baker talked.
	"	6 specimens of iron ore.
	"	12 bird-skins.
Nettlehorst School	"	Exhibit showing protective coloration.
	March	6 bird-skins showing waders, swimmers, etc.
	"	6 bird-skins of migratory birds.
	April	10 bird-skins.
	"	7 specimens of ores from the western states.
	May	4 bird-skins.
	June	4 bird-skins.

SCHOOL	DATE	SPECIMENS LOANED
Nettlehorst School	April	Nautilus and book (collections 3 and 8).
Schneider School	March	11 resident and migrant birds.
	April	7 bird-skins.
Number of schools.....33.		Number of collections loaned.....170.

The Academy serves as the distributing center for the Illinois Audubon Society, and during the year Traveling Libraries have been loaned to schools in the following towns in Illinois:

Benton	Charleston	Leaf River
Villa Grove	Virden	Morris
McNabb	Manteno	Allerton
Wood River	Cisne.	Benton (second time)
Assumption		

The Bird Picture Collections were loaned to schools in the following towns in Illinois:

Avenue H., Chicago	Quincy	Maroa
Kilbourne	Charleston	Villa Grove
Camp Point	Malta	Lebanon
Virden	Mascoutah	Woodstock (second time)
Leaf River	Morris	Crescent City
Deer Creek	Woodstock	Lynn Center
Oak Park	Allerton	

A Bird Picture Collection was loaned the Superintendent of Schools of McLean County, Ill., to be sent to all schools in that county.

A Lecture with accompanying slides was loaned to schools or societies in the following towns:

Sterling	Humane Society of	Humboldt
Wilmette	Chicago	Rockford
New Athens	Forreston	La Salle
Morrison	LaGrange	Two schools in
	Mason City	Chicago

During the school year Mr. Baker has given twenty-five lectures in the public schools, the aggregate attendance at these lectures amounting to 11,500. The demand for such illustrated lectures on natural-history subjects is almost more than we can supply without seriously interrupting the other work of the Academy. The opportunity in this field is good, and the Academy should be in a position to take a greater advantage of this opening.

The record of these lectures is given in the following table:

SCHOOL LECTURES BY F. C. BAKER

SCHOOL	AUDIENCE
Agassiz	300
Audubon	1,200
Blaine	1,000
Burley	78
Chase	400
Coonley	1,000
Coonley (at the Academy)	15
Field	200
Franklin	500
Franklin	350
Greeley	150
Hayt	1,000
Jahn	500
Knickerbocker	50
Morris, Robert	700
Ogden	160
Public Library, Children's Room.....	100
Ravenswood	500
Ravenswood (two series)	650
Ravenswood	400
Schneider	700
Seward Park	350
Stewart	600
Thomas	200
Waller High	200
Number of schools	21
Total, number of Pupils	11,303

It has been our custom to make a record of the classes that attend the Museum with an instructor, and the following table includes those that we have actually registered upon such visits. The table indicates that during the year fifty-three such classes have visited the Museum. This is a minimum number, for there are undoubtedly many cases when teachers have brought groups of children to the building and not registered that visit.

SCHOOL	ATTENDANCE
Arnold	100
Anderson	22
Avondale	19
Batavia High School	12
Blue Island	18

THE CHICAGO ACADEMY OF SCIENCES

SCHOOL	ATTENDANCE
Burley	78
De Witt	4
Evanston Academy	6
Forest Park	45
Goodwin	20
Glencoe	14
Holy Trinity Academy	16
Holy Trinity Academy	19
Holy Trinity Academy	25
Half Orphan Asylum (Ulrich's)	60
Half Orphan Asylum (175 Burling St.)	30
Half Orphan Asylum (175 Burling St.)	11
High School, La Grange	9
Jewish Manual Training	35
Jewish Manual Training	45
Jefferson High	15
Jefferson High	8
Kimball	12
Libby	16
Lemont	100
Lutheran Orphan Asylum	21
Lyons	30
Morris	13
Munster	11
Northwestern Academy	9
Otis	8
Parker	22
Parker	10
Parker	17
Parker	10
Parker	7
Parker	18
Preparatory Intercollegiate School	30
Prescott	15
St. Catherine's	11
St. Veronica's	30
St. Mary's Home	50
St. Catherine's	9
Sanders	35
University of Chicago (H. C. Cowles)	15
Waller High (Robert)	45
Waller High (Robert)	35
Waller High (Robert)	11



A CLASS IN ORNITHOLOGY—DELEGATES FROM NORTH SIDE SCHOOLS

SCHOOL	ATTENDANCE
Waller High (Robert)	10
Waller High (Robert)	30
Waller High (Robert)	24
Waller High (Robert)	12
Western Springs	11
Number of schools	37
Number of students in such classes.....	1,288

A more systematic organization of such work is desirable. We should have museum aids or assistants who are familiar with the material here and with the methods of making such material valuable in educational work, and the teachers in the schools should make regular appointments with such assistants to meet classes and conduct them through the portion of the Museum in which they are interested, or to exhibit material that is not now in cases, to classes at work in the various natural-history sciences. Such work is organized in Milwaukee, where the public-school board pays the salary of three instructors who make regular appointments with those teachers who wish to bring classes to the Museum, and by an adjustment of the programme each teacher is permitted to make a certain number of appointments with the Museum staff each year.

These various lines of work that have been undertaken in co-operation with the schools have opened a great field of usefulness for the Academy, and our location on the North Side of the city away from institutions that might do similar work in other portions of the city makes it evident that we are justified in promoting this line of work as far as our resources will permit. Such work should be done for the entire city, and if funds were available, the Chicago Academy of Sciences might well organize this larger work and come to play a part in this community similar to that played by the American Museum of Natural History in the city of New York.

There is no constituency with which we can do more effective work than the children, and a *children's museum* in an adjoining building would be a most desirable and effective addition to our facilities. The Smithsonian Museum has devoted one small room to exhibits arranged for children. They have merely made a beginning in that line. In Brooklyn there is a small building devoted to a children's museum. As yet Chicago

has no such museum, but it is to be hoped that we will soon see such an addition to our plant. Our location is ideal for a children's museum, and ground space adjoining our present building is available.

Public lectures.—In addition to the free use of the Museum we have aimed to reach the general public tributary to Lincoln Park, by offering Friday evening lecture courses. During the past year two such courses have been organized and conducted at the Academy building. One series began February 19 and continued until April 9. The programme of this course was as follows:

February 19—"The Volcano of Kilauea." By Mr. William A. Bryan, President, Pacific Scientific Institution.

February 26—"The Deserts of Arizona." By Dr. Henry C. Cowles, Assistant Professor of Ecology, The University of Chicago.

March 5—"Studies in Geology: The Grand Canyon of the Colorado River." By Dr. Wallace W. Atwood, Secretary of the Academy.

March 12—"Studies in Geology: The High Mountains of North America." By Dr. Wallace W. Atwood, Secretary of the Academy.

March 19—"Ancient and Modern Inhabitants of the Great Plains." By Dr. S. W. Williston, The University of Chicago.

March 26—"The Conservation of Our National Resources." By Mrs. Jane Perry Cook, Head of Department of Geography, Chicago Normal School.

April 2—"Studies in Geology: The Geological History of the Chicago Region." By Dr. Wallace W. Atwood, Secretary of the Academy.

April 9—"Travel and Exploration in Alaska." By Dr. Wallace W. Atwood, Secretary of the Academy.

During the fall a series of five lectures was offered beginning October 22 and ending November 19. The programme of this fall course included the following lectures:

October 22—"The High Mountains of North America." By Wallace W. Atwood, Secretary of the Academy.

October 29—"The Geological History of the Chicago Region." Repeated by special request. By Dr. Wallace W. Atwood.

November 5—"Plant Societies of the Chicago Region." By Dr. Henry C. Cowles, The University of Chicago.

November 12—"Pearls and Pearl Buttons." By Mr. Frank C. Baker, Curator of the Academy.

November 19—"Travel and Exploration in China." By Dr. Rollin T. Chamberlin.

In addition to these Friday evening lectures, open lectures were given on the evenings of January 26, February 23, and March 23.

The programmes for the above lectures were as follows:

January 26—"Yellowstone National Park." By Mr. Charles Truax.

February 23—Darwin Memorial Meeting. "Some of the Principles of Organic Evolution as Revealed in the Pigeon World." By Professor C. O. Whitman, The University of Chicago.

March 23—"Our Spring Visitors, the Birds." By Mr. Frank C. Baker, Curator of the Academy Museum.

In all, sixteen lectures have been given during the past year to which the public were invited. At each of these lectures the seating capacity of our lecture hall was completely exhausted, and at most of them all available standing room was occupied and many have crowded about the door. A police officer has been stationed at the hall each evening to see that the regulations of the fire department were complied with, and it has been necessary on several occasions to turn away many who wished to attend the lecture. The total attendance at these lectures was not less than 4,000. There is no doubt but that the Academy can do an important work through such a series of lectures, and it is unfortunate that a suitable hall is not available.

Special meetings.—There have been eight meetings of the Entomological Section, and one meeting of the Microscopical Section. The meeting of the Microscopical Section was held February 2 at the Academy, in co-operation with the State Microscopical Society of Illinois. There was an attendance of 500 at this meeting.

The lecture hall has been used during the year for five special meetings of the public-school teachers. Mr. A. L. Stevenson, principal of the Lincoln School, and vice-president of the Academy, has held a meeting of his teachers here, and

District Superintendent Charles D. Lowry has held several meetings for his teachers or principals here at the Museum.

Publications.—Two numbers of the *Bulletin* have been issued during the past year. No. 1 was devoted to the annual reports of the preceding year, and No. 2 to the fall announcements of educational work of the Academy. These bulletins have been freely used for giving publicity to the activities of the Academy. They have been distributed to all members, to those on the exchange list, and to teachers and principals and others who were, or might become, interested in the work of the Academy.

One special publication has been issued as Bulletin 7 of the Natural History Survey, entitled *Higher Fungi of the Chicago Region*, by Dr. Will S. Moffatt. This special publication has been distributed to members and to those upon the exchange list, and several copies have been sold. Physicians, educators, and those interested in pure science have expressed to us their appreciation of this special publication, and commended it highly for its scientific and practical value. It is an excellent addition to the Natural History Survey of the Chicago Region which the Academy has been at work upon for a number of years.

We have the prospect of a volume on the *Algae of the Chicago Region* which may be added to this series. In connection with the National History Survey, we hope also to prepare a chart and possibly a model of the rock surface underlying the city of Chicago. Thousands of well records and many data from deep excavations made in connection with buildings and tunneling throughout the city have been collected, and the compilation of this material and the exhibiting of it upon a chart will prove of great practical value to all contractors. This work deserves the hearty support of the Academy, and we may expect co-operation on the part of the contractors and engineers in the city.

Attendance at the Museum.—During the last few years no absolute record of the daily attendance at the Museum has been kept. There is no mechanical means provided for attending to such a count, and the present force is engaged in other work. It is, however, evident to those present at the Academy building each day that the attendance is large. During the summer months the Museum is actually crowded every day, and throughout the year the attendance on Saturdays, Sundays, and holi-

days is especially large. There is no reason to believe that the annual attendance is less than that which we had during the period when a record was kept, which, on the average, amounted to about 300,000 people.

Membership.—The membership of the Academy includes:

Active members who have paid up to date.....	78
Corresponding members	4
Life members	13
Fellows	20

During the past year there have been added:

Active members	5
Life members	3

The executive board has approved and recommended for election at this meeting:

Active members	8
Associate members	34

With the election of members at this meeting the total number of active, life, corresponding, associate members, and fellows is 157.

The problem associated with membership in the Academy is not a simple one. Most of the privileges of membership in the Academy are given to the public, and the question naturally arises with anyone who is invited to become a member, why is membership necessary? There will always be a small number of people who will continue in active relation to the Academy without expecting personal gain or returns for their membership fees, and the position may be taken that the membership of the Academy should be limited to such persons, and the activities of the Academy be philanthropic. Another policy might be so to conduct the work of the Academy and so to limit the advantages, that membership would be necessary to gain the advantages offered by the Academy. The publications are limited to the members, lecture courses could be arranged which were open to members only, or possibly to members with an invited guest, and special meetings, possibly social functions, could be arranged to which members and their guests could come. Still another policy could be pursued embodying some of the features of the other two. We may develop a series of privi-

leges open to members only, and sufficiently attractive in themselves to induce one to become at least an associate member. At the same time, we may continue to offer as much, at least, as we are now offering free to the public. According to our present plan the associate members have all the advantages of active members except those of voting and holding office.

The relationship of the Academy to the public during the past year may be tabulated as follows:

Annual attendance at the Museum.....	300,000
Annual attendance at public lectures.....	4,000
Attendance at the 12 lessons in the first teachers' course (28 teachers \times 12 lessons).....	336
Attendance at the 6 lessons in the young people's course, (6 lessons \times 122 pupils).....	732
School children addressed by delegates to young people's course	50,000
Children addressed at schools by Mr. F. C. Baker, of Museum staff	11,303
Loan collections from Museum (129 schools averaging 50 children)	6,450
Total	372,821

The prospect for the coming year is most encouraging. We have established relations that will make it much easier now to promote new educational work. The Academy has a unique opportunity, a great untouched problem in the second largest city in the country.

WALLACE W. ATWOOD, *Secretary*

REPORT OF THE CURATOR OF THE MUSEUM

To the Board of Trustees of the Chicago Academy of Sciences:

GENTLEMEN: I have the honor to present herewith my annual report of the activities of the Museum for the year 1909.

The most notable event in the history of the Museum was the recent decision of the Executive Board to limit the Museum exhibits primarily to an exposition of the natural resources of Illinois and the adjacent portions of the Mississippi Valley. This policy has been advocated by the Curator for a number of years, and it is extremely gratifying that the wisdom of such a policy has been seen and officially recognized. It is an axiom that a provincial museum should undertake the exploitation of

its immediate environment, and the failure of many of the smaller museums has been due to their having endeavored to cover the natural history of the globe. Such a policy can only be carried out by the larger institutions with their princely incomes. There is no public institution in the state which is at present making special exhibits of the natural resources of the state, and it is eminently fitting that the Chicago Academy of Sciences should be definitely committed to this policy, which is in accord with the work of the Natural History Survey of the Academy which has been conducted for the last twenty years, and also with the Ecological Survey now being carried on by the Illinois State Academy of Science.

With the change in the policy of the Academy it has been possible to formulate plans by which the exhibits will be made of great educational value. The historic conception of a museum has been that it was a storehouse, and that the usefulness of the museum was in proportion to the amount of material exhibited. A group of museum men is now entering the field who believe that the storage collections should be placed in rooms devoted to study, and that the exhibit series should be prepared in such a manner that it should illustrate the more important phenomena of nature. The evolution from the storehouse to the educational condition may be seen in every museum, those institutions in which the latter condition prevails to the greatest degree being officered by men who are in thorough accord with the new movement. The educational methods of exhibiting museum material require more time and study and are much more expensive, but the results obtained infinitely compensate for the labor and expense involved.

To carry out successfully these educational plans for the Museum will entail the expenditure of considerable more money than is now available. For the proper installation of many of these exhibits a large amount of accessory material will be required. The birds and mammals must be placed in their natural environments, and this will require the purchase of large quantities of artificial foliage and other accessory material. Many of the invertebrates, such as insects and shells, should be exhibited so as to show their habits of life in the swamps, the fields, and the woods. The insects particularly should be exhibited to show their life histories on the particular plants upon which they feed.

Some of the most effective group work is to be seen in the Milwaukee Public Museum, where, for example, a single exhibit illustrates the bird life of a swamp, another the nesting site of the Herring Gull and the Caspian Tern on the shore of Lake Michigan. These exhibits, however, cost about three thousand dollars each, and are thus prohibitive at the present time. It is noteworthy that in some museums this work is carried on through the munificence of private individuals who have contributed the necessary funds for this purpose. Is there not someone in the membership of the Academy who would co-operate with the Curator in the preparation of some such group illustrating the fast-vanishing life of the nesting birds of Chicago? Our regular income will scarcely afford sufficient funds to more than pay the salaries of the Academy staff, and the work above outlined, if carried on at all, must be financed by private means. The lack of appreciation for the needs, as well as the value, of such work may have been the cause for the scarcity of funds from this source in the past. With this condition in mind, it may be of value to indicate briefly some of the present and pressing needs of the Museum.

a) Additions to the Museum staff, as follows: an entomologist to take charge of our large insect collection, to which large additions would be made as soon as a competent man was secured; a man (or woman) to print Museum labels, of which a large number are needed.

b) A fund for field work; all specimens for groups should be collected by members of the Museum staff, who alone are trained to secure the information and photographs which are necessary for the making of the habitat groups.

c) Funds for securing cases, artificial foliage, and other accessories which are absolutely necessary to convey to the mind of the visitor an adequate idea of the manner in which the various animals live.

d) Funds for the purchase of new works on biology, which are absolutely necessary for the accurate labeling of the collections.

e) Funds for an additional building, which will provide room for exhibits of natural products used for commercial purposes; in other words, a branch of the scientific museum which

shall be commercial in character. Such exhibits naturally appeal to the layman who is little interested in the scientific display.

That the educational method of exhibition is of great value has been abundantly demonstrated not only by the average Museum visitor but by the pupils of the public schools who use the exhibits almost daily.

The work of the Museum during the past year may be summarized by departments, as follows:

MAMMALS

No work worthy of note was accomplished in this department. It is hoped that an exhibit may soon be made of the mammals of Illinois. The preparation of family groups of Illinois mammals is highly desirable, but funds are not available for this purpose.

BIRDS

In this department a unique attempt is being made to exhibit the nesting birds of Illinois in groups to illustrate their life histories. This is accomplished by preparing four groups which show the four principal stages in the life of a bird during its first year. These are arranged as follows:

1. Nest and eggs.
2. Young birds and male and female in breeding plumage.
3. Young and male and female in molting plumage.
4. Young and male and female in fall and winter plumage.

Each species will necessitate the preparation of from fifteen to twenty birds, and the exhibition of so many groups entails the use of a large amount of space, but the result amply justifies the expenditure. The botanical portions of these exhibits are all carefully and accurately prepared, so that many of the principal trees and shrubs of Illinois will also be exhibited, both in fruiting and flowering condition. The labeling for this exhibit is also possibly unique, each species having one large label which is attached to the outside of the case, this doing away with the difficulty of reading printed matter far from the eye, as well as improving the exhibit by the absence of the label in close proximity to the exhibit. Large distribution maps also accompany the labels and indicate the range of the birds at different seasons of the year. A decided innovation has been the abolishment of

shelving and the fastening of the exhibit to the back of the case, in such a manner as to allow of its instant removal or replacement. This method is a modification of the system in use during the past four years and illustrated in the last annual report.¹ To make use of this device it was necessary to provide solid wooden partitions for the alcove cases. These partitions have been covered with burlaps, which provides an effective background, and the interior of the cases has been painted a delicate blue-gray.

Fifteen new groups have been prepared, which, added to those previously prepared, make a total of thirty-five.

There are now completed and on exhibition the following groups in the series of the nesting birds of Illinois, exhibited in the manner above indicated:

American Robin:

1. Eggs and nest in cultivated apple tree.
2. Nesting group in cultivated apple tree.
3. Summer group in hackberry.
4. Winter group in black oak.

Cedar Waxwing:

1. Eggs and nest in American crab apple.
2. Nesting group in American crab apple.
3. Summer group in long-spined thorn.

Brown Thrasher:

1. Eggs and nest in scarlet thorn.
2. Nesting group in scarlet thorn.
4. Winter group in pear thorn.

Blue Jay:

1. Eggs and nest in American elm.
2. Nesting group in American elm.

Mourning Dove:

1. Nest and eggs in white cedar.
2. Nesting group in white cedar.

Hairy Woodpecker:

1. Nest and eggs in dead tree.
2. Nesting group in dead tree.

¹ A full description of this fastening was read at the meeting of the American Museums Association in Philadelphia last May; it is published in full in the *Proceedings* of this association.



CASE CONTAINING LIFE HISTORIES OF ILLINOIS BIRDS. NOTE DESCRIPTIVE LABELS ON OUTSIDE OF CASE

Bluebird:

1. Nest and eggs in dead tree.
2. Nesting group in dead tree.

Screech Owl:

1. Nest and eggs in dead tree.
2. Nesting group in dead tree.

It will be noted that several of the species are incomplete. This is due to the difficulty of securing birds during the summer season in just the right plumage. Of the above species, the Blue Jay, Mourning Dove, Screech Owl, and Bluebird will soon be rendered more complete by the addition of at least one of the missing stages.

The following groups are nearly ready for exhibition, or will be finished during the coming year:

Barn Swallow	Bobolink
Bank Swallow	Yellow-billed Cuckoo
Cliff Swallow	Short-billed Marsh Wren
Ovenbird	House Wren
Red-eyed Vireo	Trails Flycatcher
Phoebe	Song Sparrow
Catbird	

A new case had been provided for the taxonomic, or systematic, series of Chicago birds, and during the coming year it is proposed to rearrange this entire collection, providing descriptive labels for each family and generally rearranging the collection so that it will be of greater value to the school children and other students visiting the Museum.

Mr. Woodruff has been called upon to identify considerable avian material for the public-school teachers and pupils as well as for a number of Museum visitors.

FISHES, REPTILES, AND BATRACHIANS

Little or no work has been done in these departments. It is proposed eventually to exhibit as complete a collection as possible of the fishes, batrachians, and reptiles of Illinois, but funds have not previously been available for carrying on this work. A few specimens have been placed in alcohol.

MOLLUSCA

An attempt is being made, and we believe successfully, to render this department of greater value to the student as well as to the average Museum visitor. The usual collection of mollusks consists of a seemingly endless number of species, arranged in strict accordance with scientific nomenclature. In this department the storage idea has always predominated, the purpose being to exhibit all of the obtainable species, both gigantic and microscopic. To 99 per cent. of the Museum visitors such a collection is a perfect jumble of shells, and is usually passed by with little more than a glance. In order that the fault might be remedied, the Curator studied the visitors in the Museum, listened to their remarks, and questioned many as to their interest in the subject. This study has conclusively proven that a complete rearrangement is necessary in the methods of exhibiting this class of animals.

Plans have accordingly been made which will provide the following arrangement of this department:

1. A synoptic collection illustrating the broad principles of classification. Only the more important families will be exhibited, illustrated by a few typical representatives.

2. *Geographic distribution*.—Under this head will be exhibited those species peculiar to certain regions, such as *Campelema* to the eastern United States, *Cerion* to the West Indies and Florida, *Polygyra* and *Ashmunella* to portions of America, etc. Maps and photographs of habitats will also be freely used.

3. *Faunal exhibits*.—Collections illustrating the prominent species inhabiting certain areas are of great value, as travelers are constantly asking information concerning the shells which they have collected in California, Florida, or other parts of the world. This exhibit will include such topics as,

- Marine shells of the Pacific Coast.

- Marine shells of the Atlantic Coast.

- Marine shells of Florida.

- Land shells of western America.

- Land shells of Eastern America.

- Land shells of Mexico.

- Fresh-water mussels of the Mississippi Valley.

4. *Structural characteristics*.—This exhibit will include a collection of specimens illustrating the general anatomy and

structure of this class of animals, including protective adaptation and mimicry. This exhibit will be introductory to the other collections.

5. *Ecology or habitat relations*.—This subject, which is now claiming the attention of many biologists, will be illustrated by models showing the animals and their surroundings. Such subjects as the following will be treated in this manner:

- Snails of a muddy beach.
- Snails of a sandy beach.
- Snails of a rocky beach.
- Mollusks of the swamp.
- Mollusks of the rivers.
- Mollusks of the ponds and lakes.
- Mollusks of the woods.
- Mollusks of the deserts.

6. *Mollusca of Illinois*.—In this exhibit all of the species of Illinois mollusks will be exhibited, and it is hoped that a relief model of the state showing drainage areas may be secured to place with this exhibit.

7. *Mollusca of the Chicago area*.—This collection will be separated from the general collection, as heretofore, and will be kept as complete as possible.

8. *Economic mollusks*.—Under this head will be exhibited collections illustrating the use of pearl for purposes of art and economy, such as pearl buttons, inlaid work, and pearl articles of all kinds. Mollusks used as food will also be treated under this head.

One complete case has already been rearranged in accordance with this new plan, that relating to the structure of mollusks. To render the display more effective, false bottoms have been provided for the cases, which bring the objects nearer the glass and hence nearer the eye; it has also been possible to install these bottoms, made of compo board covered with black percaline, on a considerable slant, thus presenting a better appearance as well as rendering the collections much easier to study. Large labels have been placed on the end of this case with white letters two inches high, which read "Structure of Mollusks." It is planned thus to label all cases throughout the Museum, so that visitors may see at a glance which cases contain the objects in which they are most interested.

Considerable work has been done on the collection of mollusca. An exchange was made with the American Museum of Natural History by which artificial foliage was secured for the preparation of a group illustrating mangrove-inhabiting mollusks. This has been completed and is now on exhibition. A group called "How Bivalve Mollusks Live" has been prepared, and illustrates the habits of several clams and oysters. Figures and descriptions of the embryology of bivalve mollusks have also been prepared, and, with the exhibit last spoken of, placed over the case of structural exhibits. The case of Illinois mollusca is now being prepared.

Considerable attention has been given to the installation of the material received during the past few years, resulting in adding about 3,500 specimens to the general-study series. This work is tedious, requiring an abundance of time for the identification of the specimens, the writing of labels, and the necessary technical details of installation. About 25,000 specimens still await opportunity for classification.

The collection of American Lymnæas, believed to be one of the largest extant, and forming the basis for the Curator's monograph on this subject, has been completely rearranged in a large unit case of 63 drawers and is now ready for permanent labeling. It contains nearly 1,500 lots and upward of 20,000 specimens.

A new series has been added to this department which is, perhaps, unique in general museum treatment. It is known as the ecological series, and will contain material collected during ecological surveys. It will represent, so far as possible, all of the species of mollusks, as well as some other animals which occur associated together in certain habitats. At present this collection contains material from thirty-seven stations (embracing 1,202 specimens) and illustrating the molluscan ecology of the Skokie Marsh area in Illinois. A similar series is being prepared to illustrate the ecology of Tomahawk Lake, Wis. Each series forms the basis of a paper soon to be published.

INSECTS

The Academy was fortunate in securing the services of Mr. Charles Selden, an ardent young entomologist, during a portion of the year. Mr. Selden rearranged, spread, and renovated the

entire collection of Lepidoptera. The collection is now properly installed in approved storage cases. About 3,000 specimens were thus provided for. This work should be continued by a competent entomologist, and our entire collection, containing over 35,000 specimens, should be safely installed in proper storage cases. The exhibit collection should be reduced in number so that it contains a general synoptic collection, a series of local insects, and a good collection of injurious insects. Mr. Selden prepared fifteen specimens of moths and butterflies, showing their metamorphoses, and also prepared an exhibit series of the Lepidoptera of the vicinity of Chicago. Several interesting series of Lepidoptera peculiar to South America, India, and Japan were also prepared.

LOWER INVERTEBRATES

Little work has been done on the lower invertebrates, owing to lack of both time and material. Sixty-seven specimens have been determined, labeled, and added to the study series.

BOTANY

During the past year two additional herbarium cases have been provided, and Miss Carrie A. Reynolds of the Lake View High School has devoted considerable time to rearranging and labeling the botanical collection. As this service is entirely voluntary, and Miss Reynolds can spare but little time from her school duties, the work progresses slowly. It would be highly advantageous if someone could be secured to serve as both botanist and librarian.

PALEONTOLOGY, GEOLOGY, AND MINERALOGY

Early in the year the entire collection of fossils was moved toward the northern end of the Museum to make room for the new exhibits of mollusca. Other than this, no work has been done on these collections. It is planned to arrange these on the same lines as the other collections, giving precedence to Illinois material. It is hoped that collections illustrating the mineral resources of the state may sometime be made and properly installed. At present, lack of space forbids such an exhibit.

One hundred and thirty-eight specimens have been labeled and added to the study series.

TAXIDERMIC DEPARTMENT

The Taxidermic Department, under the direction of Mr. F. M. Woodruff, has shown a most satisfactory condition. During a large portion of the year the services of Mr. Emil Youngren were secured as assistant taxidermist, and the amount of work turned out indicates the necessity and value of additional assistance. Mr. Woodruff has prepared the bird groups mentioned on a previous page, besides mounting a number of birds for exhibition in addition to the school collections. Mr. Youngren has assisted in the preparation of the skins, in labeling the study series, and in field work. The beautiful appearance of the cases containing the bird groups is due entirely to the careful work of Mr. Woodruff.

The actual work accomplished may be tabulated as follows:

Birds mounted	106
Bird-skins labeled	500
Bird-skins made	465
Bird groups finished and in preparation.....	25
Bird stands prepared for school collections.....	60

FIELD WORK

This branch of the Museum work, which is not only of great importance, but without which no results of value can be obtained, was pushed with vigor during the greater part of the year. A generous appropriation of the Trustees made this possible, and the results fully justify the expenditure of both time and money. Search for the young of our nesting birds must be actively and continuously carried on during about three months of the year. As the young birds are not only difficult to find but can be taken only when at the right age, it is frequently necessary to make several trips for one set; although, of course, other material is searched for at the same time, and each trip produces some additions to the collection. Field work must, of course, be carried on during the entire year to secure the birds in their several plumages.

Mr. Woodruff and Mr. Youngren have made collectively about seventy-five trips to the environs of Chicago, while Mr. Woodruff has made several more extensive excursions, including trips to Starved Rock, where material for the Cliff Swallow group was secured.

The finding of a colony of Black-crowned Night Herons was a notable event, and enough material was secured to illustrate rather fully the nesting habits of this species. It is hoped that funds may be secured adequately to display this fine material.

The Curator spent several weeks in the eastern states during May and June and secured collections at Philadelphia, Pa., Hartford, Conn., Boston, Mass., and Rochester, N. Y. During the month of August a preliminary reconnoissance was made by the ecological committee of the State Academy of Science at Havana, Ill., and some material, including three young Double-crested Cormorants, was secured. Work on an ecological survey of the Mollusca of the Skokie Marsh area was completed. Additions received through the field work of the Museum staff may be tabulated as follows:

Adult birds	433
Young birds	27
Eggs	7
Nests	21
Mollusks	3,597
Batrachians	7
Insects	41
Marine invertebrates	10
Total	4,143

PRINTING AND CATALOGING

The printing and cataloging, besides all of the stenographic work, is performed by Miss M. G. Bunnell. There is need for a division of this work, as it is now quite out of the question for one person to do successfully the printing and the other office work as well. Labels are absolutely essential in the Museum, and many exhibits are suffering from lack of legible printed matter.

New type of twelve-point size has been added, with which the new labels are being printed. A fine quality of Royal Worcester Bristol-board has been secured, upon which all labels for exhibition are now being printed. This board is non-fadable, besides presenting a pleasing appearance with its ivory-like finish.

The work accomplished by this department is tabulated below:

PRINTED MATTER

	KINDS	IMPRESSIONS
Descriptive labels	458	6,591
Smaller labels	40	613
Hand-printed labels.....	1,072	1,072
Total printed matter.....	1,570	8,276

CATALOG ENTRIES

Museum registers	1,272
Museum card catalogs.....	2,277
Library card catalogs.....	100
Total entries	3,649

In addition to this work, Miss Bunnell attends to the correspondence, besides acknowledging library donations.

PHOTOGRAPHY

This department, under the direction of Mr. Woodruff, has produced the following results:

Negatives	202
Slides	222
Prints	105
Total	529

The value of photographic work in the Museum is not sufficiently appreciated. Without the assistance of the camera no field work of value is possible, for photographs of environments are an essential in all ecological work. Photographs of the nesting sites of birds, of invertebrate habitats, and of various other subjects are also necessary in the Museum to convey an adequate idea of the surroundings of familiar animals. Its value in preparing illustrative material for the stereopticon is beyond question.

THE MUSEUM AND THE PUBLIC SCHOOL

The Museum has been made use of by the public schools of Chicago to an unprecedented degree. Two lines of usefulness have been developed, the first being the use of the Museum exhibits by classes and the second the preparation of loan collections to be sent to the schoolroom.

CLASSES IN THE MUSEUM

Classes ranging in grade from the kindergarten to the high school have visited the Museum with their teachers and have

received instruction varying from a pleasant ramble among the cases to a serious lesson in the assembly hall. This use of the Museum should be encouraged. It would be of great value if the work of the schools could be so arranged as to include, at least once a year, a visit to the Museum by the pupils of every schoolroom. This visit would fittingly supplement the nature-study work of the year. It is to be noted that school children visit the Museum by thousands on Saturdays, holidays, and after school, and these little visitors study the exhibits far more than does the average adult who visits the Museum. The children are allowed to roam about the exhibition halls at will, and are not checked unless they become disorderly.

Fifty-three classes visited the Museum for serious study; a list of these will be found in the report of the Secretary.

TRAVELING OR LOAN COLLECTIONS

Although the Curator has made a practice of loaning specimens to certain teachers since the Museum was first opened to the public fifteen years ago, it was not until the present year that this work was taken up systematically. In the spring a number of bird-skins, in addition to some shells, minerals, and other specimens, were loaned to many North Side schools, and the experiment proved conclusively that this line of museum work could be carried on by the Academy with great profit.

During the early summer the Curator visited the museums in Philadelphia, New York, Brooklyn, and Boston for the purpose of studying the loan-collection question as solved by these institutions.¹ The result has been the preparation of twenty trial collections, ten of birds and ten of economic subjects. The birds are all mounted (experience having shown that a bird-skin is totally unfit for pedagogical work), and are arranged in sets of six, each set representing a distinct topic. The sets are transported in strong wooden boxes of $19\frac{1}{4} \times 14 \times 13\frac{1}{2}$ inches dimension. The bird stands slide into the box in grooves, and are held so firmly that the box may be rolled over without injuring the specimens. Handles are placed at both ends, and transportation is effected by two boys from the higher grades. The method of transportation and the arrangement in definite sets are believed to be unique.

¹ See this publication, *ante*, pp. 26-34.

The economic series is contained in smaller boxes of 13×9×14 inches dimension. These boxes are divided into compartments in which each object is placed, the smaller specimens being fastened to heavy cards. Literature, more or less extensive, maps, and photographs accompany each loan collection.

These collections now include the following subjects:

BIRDS

1. Winter Residents.
2. Residents.
3. Early Spring Arrivals.
4. Birds of the Great Lakes.
5. Birds That Live Mostly in the Air.
6. Summer Residents.
7. Birds That Live Mostly in Swamps.
8. Birds of the Shores of Lakes and Ponds.
9. Birds of Prey.
10. Seed-eating Birds.

ECONOMIC COLLECTIONS

101. The Pearl Button Industry.
102. The Ivory Button Industry.
103. Some Common Minerals.
104. Artificial Abrasives.
105. Iron and Steel Industry.
106. Aluminum Ores and Products.
107. Coal.
108. Eight Common Rocks.
109. The Silk Industry.
110. Pond Snails. To be used with an aquarium.

Collections have been sent out one hundred and twenty-nine times to the schools of the North Side, and have included the following material:

SPECIMENS		SPECIMENS	
Birds	524	Slides	125
Silk industry	120	Physiographic models	2
Ores	80	Common rocks	18
Mollusks	63	Mammal skulls	3
Fossils	7	Button industry	340
Insects	51		
Total	1,333 specimens		

It is noteworthy that the bird collections are the most popular among the children; the list of collections loaned in the fall shows this preponderance graphically:

SERIES	NUMBER OF TIMES LOANED
Birds	38
Ores	14
Silk Industry	8
Pearl Buttons	7
Ivory Buttons	4
Common rocks	2

During the year the Curator has been called upon to give a number of simple bird talks in the schools, thirty-seven such talks having been given to audiences aggregating 11,500 children. Several bird lectures have also been given to adult audiences.

Many requests have been received to continue this work, and it may be advisable to carry it on to an extent which will not too seriously interfere with the more important work of the Museum.

A list of the schools reached both by lectures and by traveling collections will be found in the report of the Secretary.

RESEARCH WORK

The additional duties entailed in preparing the loan collections, in giving bird talks in the schools, and in the general increase of Museum work, have left little time for this important branch of the Academy's work. A report on the "Molluscan Ecology of the Skokie Marsh Region" was prepared under the auspices of the Ecological Committee of the State Academy of Sciences and will be published by the Illinois State Laboratory. The Curator represented the Museum at the Philadelphia meeting of the American Association of Museums, held May 11 to 14, and read papers on "Museum Cases without Shelves" and "Suggestions for an Educational Exhibit of Mollusks." These will be published in the *Proceedings* of the Association.

The following papers have been published, based on collections belonging to the Museum:

"The Natural History Survey of the Chicago Academy of Sciences,"

Proceedings American Association of Museums, II, pp. 15-19, 1908.

"A New Species of *Lymnaea*," *Nautilus*, XXII, No. 12, pp. 140-41, April.

- "Description of a New Fossil Lymnaea," *Nautilus*, XXIII, No. 2, pp. 19-21, June.
- "Note on *Planorbis binneyi* Tryon," *Nautilus*, XXIII, No. 3, pp. 41-42, July.
- "The Chicago Academy of Sciences; Its Past History and Present Collections," *Museums Journal*, VIII, No. 12, pp. 423-28, June.
- "Range of *Lymnaea Umbilicata*," *Nautilus*, XXIII, p. 8, November, 1909.
- "Report on the Educational Work of Some East American Museums," *Bulletin Chicago Academy of Sciences*, III, pp. 26-34, 1909.
- "Mollusks from Kansas and Oklahoma," *Nautilus*, XXIII, pp. 91-94, December, 1909.

RELATIONS TO OTHER MUSEUMS

As in past years, the Curator has been called upon to furnish information concerning various museum subjects to a number of institutions. This has included suggestions for labels, catalogs, case designs, and other questions of museum technique, as well as questions relating to collecting and general field work.

Specimens to the number of about two thousand, largely mollusks, have also been examined and determined both for institutions and for private individuals.

In addition to the above, the Curator is constantly called upon to furnish information for museum visitors, school children, and teachers, in the various branches of nature-study work. Not a little time is also consumed in answering questions received through the mails from all parts of the United States.

The Museum has been visited, officially and unofficially, by a large number of museum men, teachers, and students of nature, who have been shown every possible courtesy.

ACCESSIONS TO THE MUSEUM

The additions to the Museum number 12,326, representing 202 separate accessions. The greater part of this material is scientifically of great value, as it is accompanied by full data as to location, habitat, collector, etc., and has been secured, for the most part, by trained collectors.

The additions may be tabulated as follows:

Minerals and ores.....	222
Fossils	100
Botanical specimens	440

Lower invertebrates	31
Insects and insect larvae.....	138
Mollusca	10,782
Fishes	2
Reptiles and batrachians.....	14
Birds	545
Birds' nests	21
Birds' eggs	21
Mammals	10
	12,326

Among the accessions, the following are specially notable:

Bryant Walker, Detroit, Michigan: 28 Lymnaeas from Michigan.

L. E. Daniels, Laporte, Indiana: 84 fresh-water mollusks from Indiana and other parts of the United States.

Harold Hannibal: 169 fresh-water mollusks from California.

S. S. Berry: 80 fresh-water mollusks from the western part of the United States.

A. A. Hinkley (purchased): 4,500 land and fresh-water mollusks from northeastern Mexico.

International Button Company, Rochester, New York: 93 specimens of ivory and pearl buttons.

A. T. Rider, Chicago, Illinois: 200 minerals and fossils.

E. E. Hand, Wendell Phillips High School, Chicago: 615 fresh-water mollusks from Michigan.

John Hall, Rochester, New York: 58 marine shells and 22 minerals from Conway River, North Wales.

Onward Bates, Chicago: Trumpeter Swan from Washington.

Fred E. Gray, Derby, England: 20 minerals from Derbyshire, England.

Edward E. Armstrong: 35 birds collected near Chicago.

F. B. Isely, Tonkawa, Oklahoma: 60 mollusks from Oklahoma and Kansas.

Jewish Manual Training School, Chicago: 10 American mammals.

Mrs. Iner W. Johnson: 52 minerals, 135 marine mollusks, and 14 echinoderms, collected in the vicinity of San Diego, California.

G. Dalas Hanna, Lawrence, Kansas: 100 fresh-water mollusks from Kansas.

Commissioners of Lincoln Park, Chicago: 19 birds.
 Funk & Wagnalls Company, New York City: 24 plates illustrating color lithography as applied to bird illustration.

INVENTORY

On January 1, 1910 the accession books showed the following material to be in the Academy's possession:

Minerals	10,670	
Rocks	565	
Fossils	22,285	
Botany	9,347	
Lower Invertebrates	2,396	
Mollusks	159,721	
Insects and Arachnids	34,080	
Crustaceans	508	
Fishes	147	
Batrachians and Reptiles	552	
Birds	4,967	
Bird nests and eggs.....	2,669	
Mammals	379	
Total specimens		248,717
Microscopic slides	1,751	
Photographic negatives	1,713	
Lantern slides	1,643	
Books, pamphlets, and maps.....	29,778	34,885
Total of material		283,602

In conclusion the Curator desires to acknowledge his indebtedness to the efficient aid of the members of the Museum staff who have worked so faithfully with him in carrying forward the work of the past year. Thanks are also due to the following persons, who have greatly assisted in the year's work either by determining critical material, by loaning material or books, or by friendly advice and criticism:

Mr. Bryant Walker, Detroit, Michigan.
 Dr. W. H. Dall, Smithsonian Institution, Washington, D. C.
 Dr. H. W. Pilsbry, Academy of Natural Sciences, Philadelphia.
 Dr. V. Sterki, New Philadelphia, Ohio.
 Mr. L. S. Frierson, Frierson, Louisiana.
 Dr. W. S. Moffatt, Chicago.

Mrs. Zella A. Dixon, Librarian, The University of Chicago.
Dr. S. A. Forbes, Director, Illinois State Laboratory of
Natural History.

Miss Carrie A. Reynolds, Chicago.

The Curator wishes also again to return his thanks to the directors and curators of the institutions which he visited early in the year for the purpose of securing information concerning the relation of the museum to the public school, mention of which was made in a previous report.²

Respectfully submitted,

FRANK COLLINS BAKER, *Curator*

REPORT OF THE ACTING LIBRARIAN

To the Board of Trustees of the Chicago Academy of Sciences:

The past year has been one of steady growth for the Library. Owing to lack of stackroom, many of the shelves are becoming much overcrowded, and additional storage facilities must soon be provided. Efforts have been made to complete certain sets of periodicals and also to secure as complete sets as possible from some societies not already carrying on exchange relations with the Academy.

The following societies have generously completed, as far as possible, the sets of their publications in our library:

American Philosophical Society.
American Academy of Arts and Sciences.
Biological Society of Washington.
Children's Museum, Brooklyn Institute of Arts and Sciences.
Connecticut Academy of Arts and Sciences.
Geological Survey of Michigan.
Maryland Agricultural Experiment Station.
Massachusetts Agricultural College.
Museum of Brooklyn Institute of Arts and Sciences.
Ohio Agricultural Experiment Station.
Peabody Museum of American Archaeology and Ethnology.
Staten Island Association of Arts and Sciences.
United States Department of Agriculture.

Dr. J. E. Siebel has also presented fifteen volumes of
Science.

²*Bulletin Chicago Academy of Sciences*, III, p. 27.

The following societies have entered into exchange relations for the first time.

DOMESTIC

New Jersey State Museum.

New York Botanical Garden.

North Carolina Geological and Economic Survey.

FOREIGN

Colombo Museum, Ceylon.

Laboratoire de Zoologie et de Physiologie Maritimes a Concarneau.

Observatorio Meteorologico del Instituto Juraz.

Société Scientifique de Chévtchéno, Lemberg, Austria-Hungary.

Transvaal Museum, Pretoria.

The library has been used professionally by a number of students and teachers. One rare volume was loaned to Princeton University, and several volumes have been loaned for short periods to teachers and special students. 1,723 pamphlets have been bound, adding 175 volumes. This much-needed work is slowly bringing the library to a condition in which it can be used without danger to the material which, in pamphlet form, is liable to be both damaged and lost.

The additions to the library by gift, purchase, and exchange number 2,160. All accessions have been properly installed in their proper places on the shelves, and have been indicated in the title card catalog.

It is not possible, without additional help, to prepare properly an analytical card catalog, a work which would add immeasurably to the usefulness of the library.

Respectfully submitted,

FRANK C. BAKER, *Acting Librarian*

ANNOUNCEMENTS

TEACHERS' COURSE

During the winter and spring months there will be a course offered at the Academy by Professor John M. Coulter, Head of the Department of Botany, The University of Chicago. This course will consist of twelve lessons on "Organic Evolution."

It is a regular University course, and those completing the work will receive credit for one minor at the University.

Among the subjects which will be treated are: "What Is Evolution"; "Origin of Species"; "Darwin and Natural Selection"; "The Struggle for Existence"; "Heredity"; "The Origin of Sex"; "Plant Breeding"; "Increasing Complexity of Plant Body"; "The Land Habit"; "The Erect Habit"; "The Conducting System"; "The Seed Plants."

This course is planned especially for teachers, and it will prove to be a most interesting and inspiring series of lessons to all who take advantage of the work.

TERMS: Regular tuition fee for this course, \$6.50. Those not members of the Academy may become Associate Members without additional fee and receive the advantages of such membership for the year 1910. Those not regularly matriculated in the University of Chicago will be matriculated without additional fee. The usual fee for matriculation is \$5.00.

This course begins February 3, at 4 P. M., and will continue on Thursday afternoons until the twelve lessons have been completed.

YOUNG PEOPLE'S COURSE

During the year 1910 Dr. H. S. Pepoon, who conducted the Young People's Course in Nature-Study during the fall of 1909, will offer three courses. These courses will be open to delegates from the seventh- and eighth-grade rooms, each delegate to be appointed as a representative of his or her room and to act as reporter to the class of the work offered at the Academy. The first course begins Saturday, February 12, at 2 P. M., and continues on succeeding Saturdays until the six lessons have been given. The announcement of the other courses will be given later.

The outline of Dr. Pepoon's work for the year is given below. The syllabus has been completed for the first six lessons, and the general subject-matter has been selected for the spring and fall courses.

EIGHTEEN LESSONS IN NATURE-STUDY TO BE GIVEN IN THREE SERIES

SERIES I. Six lessons during February and March, five of the series being laboratory exercises, in part at least, and the

sixth being a field-work lesson. The laboratory lessons are one and one-quarter hours in length, the field lessons indefinite.

LESSON I. *The Narrow-leaved Evergreens or Conifers.*

- a) The special features of the leaf or needle.
- b) The special features of the bark and wood.
- c) Their fitness for cold climates.
- d) The cone-fruit, blossoms, and seed.
- e) Coniferous forests.
- f) Notable examples: big trees, pines, cedars, spruces.
- g) Economic importance of the group.
- h) Manufactured products derived from the groves.
- i) Their use in the home.

LESSON II. *Buds of Winter. Bud Type Structures.*

- a) Careful dissection of a hickory-tree bud.
- b) Interpretation of each feature.
- c) Variation in the bud covering.
- d) Diversity in size and the meaning of the same.
- e) The destiny of the winter bud.
- f) The bud structure of the bulb of cabbage.
- g) The bud in monocotyledon and dicotyledon.
- h) Fruit-growing from buds.
- i) Fruit and foliage buds. How distinguished.
- j) Uses of buds in human affairs.

LESSONS III AND IV. *The Structure of Stems. Stem Features.*

- a) The great types of structure.
- b) The meaning of bark, wood, and pith.
- c) The path of ascending and descending saps.
- d) The microscopic structure of wood. The vascular tissue.
- e) Change of epidermis to bark.
- f) Bark and wood peculiarities.
- g) Lumber and lumber trees.
- h) Cabinet woods.
- i) Products derived from stems.
- j) Planting of trees for ornament and use.
- k) Explanation of knobs, burls, curls, birds-eyes and various lumber and cabinet-wood terms.
- l) The stem as a vegetable and food source.

LESSON V. *Experiments in Food Storage in Plants.*

- a) The simple tests for oil, starch, sugar, and proteids.
- b) The grouping of vegetables according to food storage.
- c) The amount of water in our foods.

- d) What a plant lives upon.
- e) The idea of surfs.
- f) The famous clover-germ partnership.
- g) Do plants have stomachs, lungs, and blood-vessels?

LESSON VI. *The "Beginning of a New Plant and Animal Year."*

- a) Field lesson in the first evidences of renewed activity among plants and animals.
- b) The "never move" birds.
- c) The "first" birds of spring.
- d) What can be found "green" among the plants, and the explanation.
- e) A look at the buds.
- f) A dig in the ground to find out what is hidden.
- g) Is there any sap?
- h) The "pussies" of various trees and bushes.
- i) A look at the evergreens.
- j) Are there any "four-footed" active?

The remaining twelve lessons are given below as to subject-matter. It is possible that some slight change may be made in order or subject as the requirements of the same may suggest, but in the main a general idea of the contemplated course may be obtained.

SERIES II. Six lessons during late April and May, three of which, at least, are to be field-work lessons. The synopsis will be given later, but the lesson subjects are:

LESSON VII (of whole series). *Bird Migration and Identification.*

Lecture and study of Academy specimens.

LESSON VIII. *The Earliest Birds.* Field Work.

LESSON IX. *The First Flowers of Spring.* Field Work.

LESSON X. *The Flowers in Families.* Field Work.

LESSON XI. *The Bird Flood-Tide.* Field Work.

LESSON XII. *The Chicago Flower Area.* Lecture with slides, maps, etc.

SERIES III. Six Lessons in September-October. Four are field work and two are laboratory.

LESSON XIII. *The Ranking Plant Family, Composites.* Field Work.

LESSON XIV. *The Outcasts and Lowly Among Plant Fungi.* Field Work.

LESSON XV. *Why and When the Birds Leave Us.* Field Work.

LESSON XVI. *Underground Stems and Roots.* Laboratory.

LESSON XVII. *Cull-Water Flowers and Vegetables.* Laboratory.

LESSON XVIII. *The Colors of Autumn and Preparation for Winter.*
Laboratory or Field.

PUBLIC LECTURES

The following courses of public lectures are announced:

- February 11—"The Iron and Steel Industry." Mrs. Jane Perry Cook, of the Chicago Normal School.
- February 18—"Glaciers of Alaska." Professor U. S. Grant, Northwestern University.
- February 25—"Water Supply and Water Purification." Dr. C. E. A. Winslow, Massachusetts Institute of Technology.
- March 4—"Bad Air Diseases in Chicago." Dr. W. A. Evans, Commissioner of Health, City of Chicago.
- March 11—"Starved Rock, Deer Park, and the Canyons of Illinois." Horace Hull, of Ottawa, Illinois.
- March 18—"The Inhabitants of Water." Dr. V. E. Shelford, of the University of Chicago.

SPECIAL COURSE ON SOCIAL HYGIENE

Friday at 4 P. M.

- January 28—"Anatomy and Physiology." Dr. Anna Blount.
- February 4—"Menstruation and Evil Habits." Dr. Kate I. Graves.
- February 11—"Development of the Ovum." Dr. Caroline Hedger.
- February 18—"Prevention of Venereal Diseases." Dr. Rachael Yarros.
- February 25—"Heredity." Dr. Harriet Alexander.
- March 4—"Ethics of Marriage." Dr. Effie Davis.

This course is given under the auspices of the Social Hygiene Committee of the Chicago Woman's Club.

LOAN COLLECTIONS

It is the policy of the Academy to promote in all ways possible the use of the Museum Collections in the public schools. During the year the number of collections available will be greatly increased, and those wishing to make use of them may keep posted through correspondence with the Academy. The officers of the Academy are desirous of improving these collections in every way possible and of adding such collections as will be used. We hope to prepare additional reading-matter to accompany the collections and, if possible, to add photographic illustrations to each collection.

Collections may be retained for one week from date of issue. Birds and other specimens of a fragile or delicate nature must not be handled by the pupils. Only one collection will be issued

at one time, but this may be exchanged for another at the expiration of the allotted time. It is expected that the collections will be returned to the Academy in good condition.

BIRD SERIES

No. 1. WINTER RESIDENTS

1. Tree Sparrow
2. American Crossbill
3. Pine Siskin
4. Slate-colored Junco
5. Redpoll
6. Snowflake

No. 2. RESIDENTS

1. American Robin
2. Prairie Horned Lark
3. Blue Jay
4. White-breasted Nuthatch
5. Chickadee
6. American Goldfinch

No. 3. EARLY SPRING ARRIVALS

1. Kingbird
2. Kingfisher
3. Song Sparrow
4. Towhee
5. Bronzed Grackle
6. Loggerhead Shrike

No. 4. BIRDS OF THE GREAT LAKES

1. Ring-billed Gull
2. Common or Wilson's Tern
3. Lesser Scaup Duck

No. 5. BIRDS OF THE AIR

1. Kingbird
2. Nighthawk
3. Hummingbird
4. Yellow-bellied Flycatcher
5. Chimney Swift
6. Purple Martin

No. 6. SUMMER RESIDENTS

1. Cowbird
2. Loggerhead Shrike

3. Crested Flycatcher
4. Bobolink
5. Red-winged Blackbird
6. Bluebird

No. 7. BIRDS OF SWAMPS

1. Green Heron
2. Sora Rail
3. Wilson's Snipe
4. Blue-winged Teal
5. Swamp Sparrow
6. Red-winged Blackbird

No. 8. BIRDS OF SHORES OF LAKES

1. Semipalmated Plover
2. Spotted Sandpiper
3. Least Sandpiper
4. Sanderling
5. Black-bellied Plover

No. 9. BIRDS OF PREY

1. Marsh Hawk
2. Cooper's Hawk
3. Screech Owl
4. American Long-eared Owl

No. 10. SEED-EATING BIRDS

1. English Sparrow
2. Rose-breasted Grosbeak
3. Song Sparrow
4. Tree Sparrow
5. White-throated Sparrow

No. 11. SWIMMING BIRDS

1. Canvas-back
2. Red-head
3. Green-winged Teal
4. Lesser Scaup Duck

No. 12. WADING BIRDS

1. Louisiana Heron
2. Black-crowned Night Heron
3. American Bittern
4. Willet

No. 13. SIX COMMON BIRDS

1. Kingbird
2. Brown Thrasher
3. Yellow Warbler
4. American Robin
5. Blue Jay
6. Bluebird

GEOGRAPHIC COLLECTIONS

No. 101. THE PEARL BUTTON INDUSTRY

Black sand shell before blanks are cut.

Black sand shell from which button blanks have been cut.

Saws used in cutting rough blanks.

Facing and drilling tools.

Hook from crowfoot dredge.

Buttons carded and ready for sale.

Evolution of a button.

Rough blanks.

Smoothed blanks.

Centered and drilled.

Polished.

Photographs.

"Clamtown" near McGregor, Iowa.

"Clamtown" near Prairie du Chien, Wisconsin.

A clam fisherman in his boat.

Fishing boat in operation.

Boiling out the clams.

Figure illustrating habit of clam in bottom of river.

Exterior of factory.

Interior of factory; cutting rough blanks.

Interior of factory; centering and drilling blanks.

Interior of factory; carding and sorting buttons.

Manuscript.

Description of button industry.

No. 102. THE IVORY BUTTON INDUSTRY

Perfect ivory nut.

Imperfect nut cut in half showing work of insect.

Imperfect nut eaten by insects.

Sawed piece; first cut.

Sawed piece; final cut.

Core; waste.

Partly turned button.

Turned button.

Waste portion after button is cut.

Turner's shavings (waste).

Sawer's dust (waste).

Card of finished buttons, showing different styles of ornamentation.

No. 103. SOME COMMON MINERALS

No. 1. Gold Ore. Cottonwood Mine, Palmers Mountain District, Okanogan County, Washington.

No. 2. Silver Ore (Sylvanite). Cripple Creek, Colorado.

No. 3. Lead Ore (Galenite). Galena, Illinois.

No. 4. Pig Lead, obtained by smelting No. 3.

No. 5. Zinc Ore (Sphalerite) on Pig Zinc, obtained by smelting the ore. Pittsburg, Kansas.

No. 6. Copper Ore. Native copper from Lake Superior.

No. 7. Copper Ore. Malachite or Green Carbonate of Copper. Bisbee, Arizona.

No. 8. Tin Ore (Cassiterite). Cornwall, England.

No. 9. Bar of pure tin extracted from ore.

No. 10. Ore of Mercury (Cinnabar). New Almaden, California.

No. 11. Mercury or quicksilver, extracted from ore.

Maps showing distribution of the following ores in the United States:

Gold.

Silver.

Lead.

Zinc.

Copper.

Tin.

No. 104. ARTIFICIAL ABRASIVES

A. Carborundum.

Crude Materials.

1. Sand.

2. Ground Coke.

3. Sawdust.

4. Salt.

Charge for furnace.

Coke.

Crystalline carborundum.

Carborundum abrasive stick.

B. Alundum.

Raw material. Bauxite.

Crude Alundum.

Internal and dental wheels made of alundum.
 Pamphlet describing carborundum.
 Pamphlet describing alundum.

No. 105. THE IRON AND STEEL INDUSTRY

Iron Ores.

- A. Hematite. Red oxide of iron.
- B. Limonite. Brown oxide of iron.
- C. Magnetite. Black oxide of iron.
- D. Siderite. Carbonate of iron; spathic iron.
- E. Spiegeleisen.

Ores broken up and ready for the furnace.

- 1. Chapin Ore.
- 2. Fayal Ore.
- 3. Aurora Ore.

F. Limestone broken up and ready to be mixed with the
 above iron ores.

G. Iron slag.

H. Pig iron.

Map showing distribution of ore beds in the United States.

NOTE.—This collection has been prepared to illustrate Rocheleau's book on *Minerals* in the series of "Great American Industries," pp. 75 to 112. This work is included by the Board of Education in the list of supplementary books.

No. 106. ALUMINUM ORES AND PRODUCTS

- 1. Bauxite, the ore from which aluminum is produced.
- 2. Hydrated alumina.
- 3. Ingot of aluminum.
- 4. Aluminum wire.
- 5. Aluminum sheet.
- 6. Aluminum bar.
- 7. Aluminum bar.

Map showing distribution of bauxite in the United States.

No. 107. COAL

- 1. Cannel coal, from England.
- 2. Anthracite coal. Pennsylvania.
- 3. Bituminous coal. Illinois.
- 4. Earthy brown coal. Washington.
- 5. Fossil fern in coal seam, from Pennsylvania.

Map showing coal fields in the United States.

Statistics.

See *Great American Industries*, Vol. I, pp. 7-162.

No. 108. EIGHT COMMON ROCKS

I. Eruptive Rocks.

1. Granite (Biotite Granite). Barre, Vermont.
2. Olivine Basalt. Holyoke, Mass.
3. Liparite; pumiceous form of lava. Kilauea, Hawaiian Islands.

II. Sedimentary Rocks.

4. Sandstone. Near McGregor, Iowa.
5. Conglomerate. Rock City, Chautauqua Co., N. Y.
6. Clay. Ottawa, Illinois.

III. Metamorphic Rocks.

7. Limestone. Isle-La-Motte, Vermont.
 8. Mica Schist. Trafalgar, Halifax Co., N. S.
- Notes.

Several Museum labels are included, describing the above three classes of rock.

No. 109. THE SILK INDUSTRY

A. The silkworm.

Eggs.

Caterpillar ten days old.

Caterpillar twenty days old.

Caterpillar thirty days old.

Cocoons.

Cocoon cut open to show chrysalis.

Chrysalis taken from cocoon.

Imago or moth.

B. The silk industry.

Cocoon ready for reeling off the silk threads.

Raw silk.

Skein of raw silk containing silk from 15 cocoons.

Uncolored silk.

Colored silk.

Spool of silk thread ready for use.

No. 110. POND SNAILS (To be used with an aquarium.)

1. Pond Snail (*Lymnæa*).
2. Orb Snail (*Planorbis*).
3. Tadpole Snail (*Physa*).
4. River Snail (*Pleurocera*).
5. Apple Snail (*Campeloma*).
6. Banded Apple Snail (*Vivipara*).
7. A Minute Water Snail (*Amnicola*).

Book of reference: *Shells of Land and Water*, pp. 11-17.

NO. III. SOME FAMILIAR COMMERCIAL WOODS

1. White Pine.
2. Poplar.
3. Red Cedar.
4. San Diego Mahogany.
5. Mexican Mahogany.
6. Walnut.
7. Cherry.
8. Sycamore.
9. Sycamore Quarter Sawed.
10. Plain Red Oak.
11. Red Oak Quarter Sawed.
12. White Ash.
13. White Oak Quarter Sawed.
14. Elm.
15. Yellow Birch.
16. Bird's Eye Maple.
17. Curly Maple.
18. Cyprus.

LANTERN SLIDES

1. Pearls and Pearl Buttons.
2. Common Chicago Birds.